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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/759,621	01/16/2004	Peter J. Hopper	100-18310 (P05271-D01)	1227
33402	7590	08/23/2005	EXAMINER	
LAW OFFICES OF MARK C. PICKERING P.O. BOX 300 PETALUMA, CA 94953			NGUYEN, HA T	
			ART UNIT	PAPER NUMBER
			2812	
DATE MAILED: 08/23/2005				

Please find below and/or attached an Office communication concerning this application or proceeding.

4A

**Office Action Summary**

Application No.

10/759,621

Applicant(s)

HOPPER ET AL.

Examiner

Ha T. Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 08 June 2005.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 14-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 14-22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 3-14 & 8-8-5.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

### **DETAILED ACTION**

1. Applicants' amendments in response to the Office Action mailed March 28, 2005 has been entered and made of record.

#### ***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 14, 17, and 19-20 are rejected under 35 U.S.C. 102(b) as being anticipated by Yang (USPN 6232215).

Referring to Figs. 4-12 and related text, Yang discloses [Re claims 14 and 20] a method of forming a semiconductor device, the method comprising: forming a layer of insulation material 44 over a semiconductor substrate 40; forming a layer of conductive material 48 on the layer of insulation material; etching the layer of conductive material to form a trace, the trace having a top surface and a bottom surface; etching the trace to form a number of slot openings in the top surface of the trace, the slot openings each having a bottom surface spaced apart from the bottom surface of the trace; and forming a layer of isolation material 64 over the trace to fill up the slot opening; wherein the conductive material is metal;

[Re claim 17] wherein the trace is connected to a contact 42;

[Re claim 19] wherein the layer of isolation material contacts the layer of insulation material (see Fig. 10).

#### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary

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skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 1038 and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 18 and 21-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yang.

[Re claim 18] wherein the trace is connected to a via 48 (see Fig. 10). Note that the conductive material in this case is 70.

[Re claims 21-22] Yang fails to teach that the slots are substantially equally spaced apart or have substantially equal widths. However, these would have been obvious when uniform features are desired.

6. Claims 14 and 20-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Knight (USPN 4541893).

Referring to Figs. 5-20 and related text, Knight discloses [Re claims 14 and 20] a method of forming a semiconductor device, the method comprising: forming a layer of insulation material, SiO<sub>2</sub> over a semiconductor substrate 20; forming a layer of conductive material 22 on the layer of insulation material; etching the layer of conductive material to form a trace (see col. 4, lines 35-40 and col. 5, lines 30-55), the trace having a top surface and a bottom surface; etching the trace to form a number of slot openings in the top surface of the trace, the slot openings each having a bottom surface spaced apart from the bottom surface of the trace (see Fig. 6); and forming a layer of isolation material 25 over the trace to fill up the slot openings (see

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Fig. 7). But it fails to disclose all the limitation in the same process. However, it would have been obvious to use the disclosed steps in a single process to obtain a desired structure.

[Re claims 21-22] Knight fails to teach that the slots are substantially equally spaced apart or have substantially equal widths. However, these would have been obvious when uniform features are desired.

7. Claims 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Knight or Yang, as applied above, and in view of Krishnan (USPN 5998299).

Knight or Yang discloses substantially the limitations of claims 15-16, as shown above.

But it fails to disclose expressly the trace is formed to have a number of loops; and wherein the loops lie substantially in a same planess.

However, the missing limitations are well known in the art because Krishnan discloses these features (See fig. 10 ).

A person of ordinary skill is motivated to modify Knight or Yang with Krishnan to obtain interconnect of desired geometry suitable for a specific application.

#### ***Response to applicants' amendments***

8. In view of applicants' amendments to the claims, the rejections of claims 14-18, as stated in the indicated Office Action have been withdrawn.

In view of the new ground of rejection, applicants' arguments have been rendered moot.

#### ***Conclusion***

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, THIS ACTION IS MADE FINAL. See MPEP ' 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for response to this final action is set to expire THREE MONTHS from the date of this action. In the event a first response is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension

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fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event will the statutory period for response expire later than SIX MONTHS from the date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ha T. Nguyen whose telephone number is (571) 272-1678. The examiner can normally be reached on Monday-Friday from 8:30AM to 6:00PM, except the first Friday of each bi-week. The telephone number for Wednesday is (703) 560-0528. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael S. Lebentritt, can be reached on (571) 272-1873. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Ha Nguyen  
Primary Examiner  
8- 16- 05